

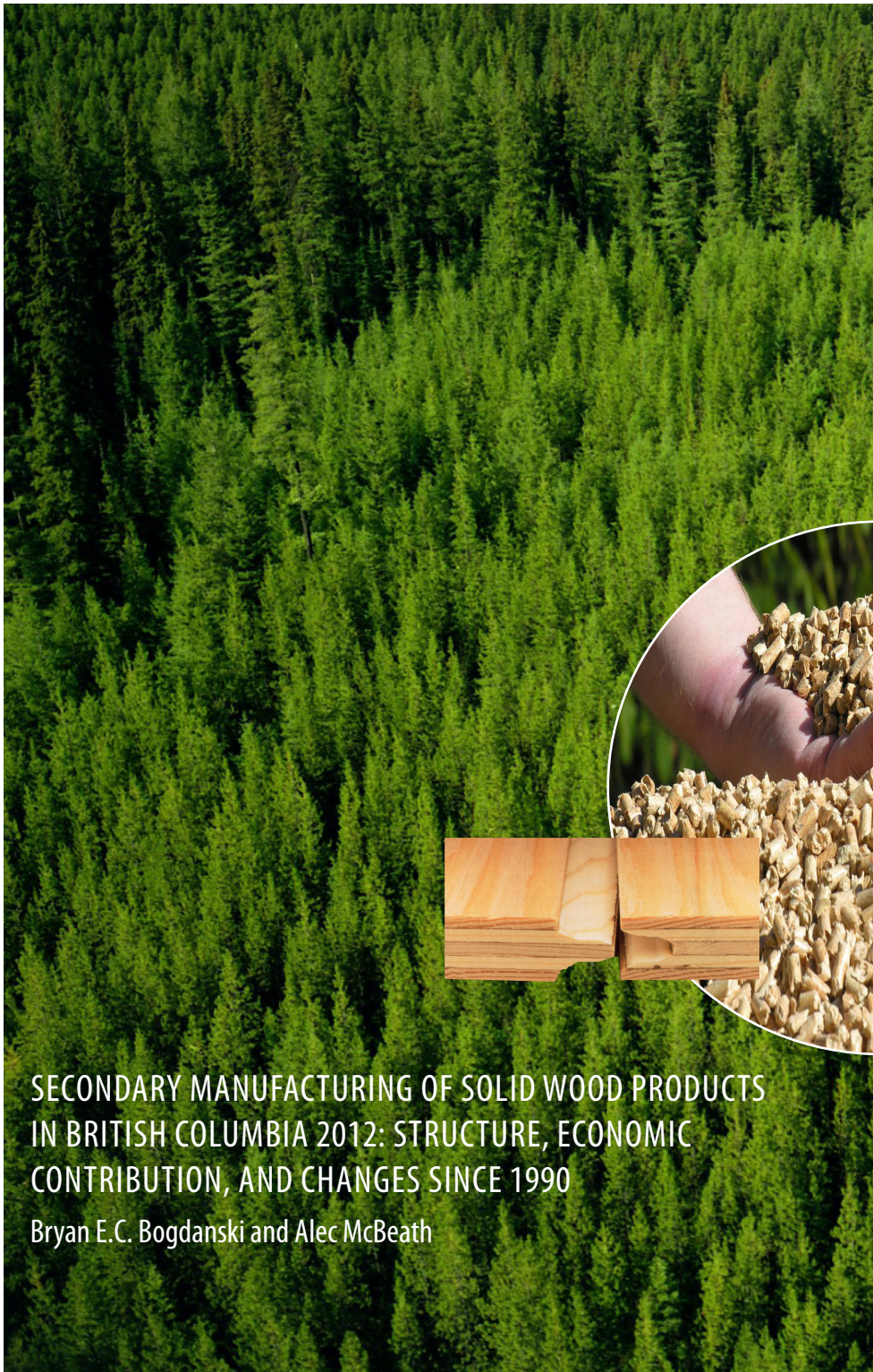


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**SECONDARY MANUFACTURING OF SOLID WOOD PRODUCTS
IN BRITISH COLUMBIA 2012: STRUCTURE, ECONOMIC
CONTRIBUTION, AND CHANGES SINCE 1990**

Bryan E.C. Bogdanski and Alec McBeath



The Pacific Forestry Centre, Victoria, British Columbia

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Secondary manufacturing of solid wood products in British Columbia 2012: Structure, economic contribution, and changes since 1990

Bryan E.C. Bogdanski and Alec McBeath

Industry, Trade, and Economics Research Program
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Abstract

The British Columbia forest industry continuously faces challenges related to the ups and downs in commodity markets and increased global competition. Such challenges were front and centre during the housing and financial crisis in the United States and subsequent great recession of 2007–2009. This report presents survey results for the province's secondary wood manufacturing industries in 2012. The survey gathered operational, employment, production, marketing, and financial information on business types, with supplemental information gathered for panelboard producers. Analysis of the survey results provides a comprehensive picture of the state of the sector's industries and allows for comparison with past surveys conducted by the Canadian Forest Service, including the last one undertaken in 2006, before the United States financial and housing crisis. Although the size of the industry has contracted since the last survey, it is much more balanced across the business types, with a shift from panelboards and remanufactured lumber products to cabinetry, millwork, and furniture, value-added businesses that are more closely tied to the domestic construction industry.

Keywords: employment, forest industry, markets, policy, secondary manufacturing, value-added

Résumé

L'industrie forestière de la Colombie-Britannique est sans cesse aux prises avec des défis liés aux hauts et aux bas des marchés des produits ainsi qu'à la hausse de la concurrence internationale. Ces problèmes se sont particulièrement fait sentir durant la crise du marché de l'habitation et la crise financière qui ont frappé les États-Unis et entraîné la grande récession de 2007-2009. Le présent rapport expose les résultats d'enquêtes effectuées auprès des industries de transformation secondaire du bois de la province en 2012 et portant sur les activités, l'emploi, la production, la commercialisation et les finances par type d'entreprise. Des renseignements supplémentaires ont été obtenus sur les producteurs de carton pour panneaux. L'analyse des résultats d'enquêtes dresse un portrait global de l'état des industries du secteur et permet de les comparer aux résultats d'enquêtes précédentes menées par le Service canadien des forêts, y compris la dernière, qui date de 2006 avant la crise financière et la crise du marché de l'habitation des États-Unis. Même si l'industrie a perdu de l'importance depuis la dernière enquête, elle est aujourd'hui plus équilibrée. L'accent n'est plus autant mis sur le carton pour panneaux et le bois d'œuvre transformé, beaucoup d'entreprises misant plutôt sur les armoires, la menuiserie et les meubles, entreprises à valeur ajoutée entretenant un lien plus étroit avec l'industrie de la construction intérieure.

Mots-clés: emploi, industrie forestière, marchés, politiques, transformation secondaire, valeur ajoutée

Key Points

- This report summarizes the results of a comprehensive survey on secondary manufacturing of solid wood products in British Columbia for the year 2012. The final survey population included 589 firms, with 242 firms responding.
- In 2012, there were 15 576 people employed in the sector with 589 firms (including all business types) having a total of \$3.82 billion in sales. These results were a drop from the 2006 levels: employment was down 21%, sales were down 22%, and the number of firms was down 20%.
- The sector (all business types) is estimated to have processed just over 20 million m³ of fibre (roundwood equivalent) in 2012, down from the estimated 25 million m³ in 2006, and 23.8 million m³ in 1999.
- Excluding shake and shingle and panelboard producers, the industry is estimated to have employed 12 417 full-time equivalents, a decrease of 16% from 2006. Responding firms employed an average of 29 people, whereas median employment was approximately 15 people per firm.
- Excluding shake and shingle and panelboard producers, industry sales were an estimated \$2.8 billion, down 11% from 2006. Ten percent of responding firms had gross sales revenue greater than \$15 million and 55% of firms fell into the medium group with sales in the \$1.1–15 million range.
- The industry is concentrated in the Vancouver–Fraser Valley area (50% of firms) and the Kamloops Forest Region (19% of firms). Overall, 65% of firms are located in the Coastal region and 35% in the Interior.
- Estimated capacity utilization was down to 66%, from 73% in 2006 and a high of 77% in 1994.
- The majority (61%) of responding firms relied on British Columbia for over half of their sales, although the United States (16%), the Rest of Canada (5%), and Japan (3%) were also important markets for many firms.
- Millwork and engineered wood product represented the largest subsector in our survey, accounting for about 24% each of all firms. Remanufacturing subsectors followed closely at 18%.

1. Introduction

In 2013, the Canadian Forest Service undertook its sixth survey of the secondary wood manufacturing sector in British Columbia to examine its structure and economic contribution to the provincial economy. The survey and its associated reports build on work related to this important sector dating back to 1990, providing another data point to better understand trends and changes in the sector. Previous surveys showed strong and sustained growth through the 1990s and 2000, albeit with a reduction in the number of firms between 1999 and 2006 (Stennes et al. 2005; Stennes and Wilson 2008). Since the last survey in 2006, the province's primary wood industries were subject to a prolonged downturn in the United States housing market and the dramatic great recession of 2008–2009, as well as new and impressive demand growth in China. It is informative to take stock of the secondary manufacturing sector to see how it held up through these challenging times.

Considerable interest still remains in promoting value-added processing as a means to maximize the level of economic activity from each unit of fibre harvested in British Columbia. The coastal sawmill and pulp and paper industries face challenges related to the maintenance of historical levels of employment and revenues. These

continuing problems are linked to competitiveness issues, restructuring, and changes in demand, as well as impending supply shocks resulting from the mountain pine beetle outbreak in the Interior. Communities in pine-dominated areas have been examining options to diversify away from commodity forest products. Secondary manufacturing of lumber into intermediate and finished products, or adding value to waste streams from the primary industries, is seen as one important strategy to help diversify these economic regions. Ensuring effective policy responses requires credible and up-to-date information on the sector. Current data will help communities and industry associations fine-tune their efforts and increase their chances of success.

Secondary manufacturing, by its very definition, increases the level of economic activity associated with harvested timber when compared to the production of primary commodity products. Table 1 shows employment and gross sales per unit of roundwood equivalent. In the case of employment, for most business types these jobs are incremental to those generated by woodlands and primary mill operations, which represents approximately 0.62 jobs per 1000 cubic meters (m³) of timber¹.

Table 1. Jobs and sales coefficients per unit roundwood equivalent, 2012

Business type	Jobs (per 1000 m³)	Sales (per m³)	Sales per full time equivalent (000s)
Cabinets and furniture	38.1	\$6198	\$130
Engineered wood products	5.3	\$1027	\$188
Millwork	24.7	\$3505	\$182
Other wood products	1.7	\$117	\$228
Pallets and containers	0.7	\$213	\$268
Remanufactured products	0.5	\$100	\$222
Shakes and shingles	1.7	\$326	\$176

¹This employment coefficient is calculated using total employment in logging, forestry, and primary mill employment for 2012 (i.e., 42 256 jobs; see Statistics Canada n.d.) as a ratio of the British Columbia harvest for 2012 derived from the province's Harvest Billing System (i.e., 68 482 thousand m³; see B.C. Ministry of Forests, Lands, and Natural Resource Operations at: <https://www15.for.gov.bc.ca/hbs/>).

The business types producing the greatest levels of employment and sales per unit of fibre input are cabinet/furniture manufacturers and millwork, which have the highest coefficients for both of these measures. In addition to looking at sales per unit of fibre, we also looked at sales per full-time equivalents (FTEs). This value is highest for pallets and containers, other wood products, and remanufactured products. The different indicator values across business types reflect the varying combinations of labour, capital,

and other inputs involved in the production of the different products within each business group. For example, cabinet and furniture production requires significant inputs of skilled labour and other materials, such as hardware, textiles, glue, and stone, whereas the production of "other wood products," which is dominated by wood energy pellet production, requires little labour but lots of machinery and wood waste materials.

The 2012 study continues with the definition of secondary manufacturing established in earlier surveys (see Stennes and Wilson 2008). Secondary manufacturing is the further processing of primary mill wood or wood-based mate-

- remanufactured products
- millwork
- engineered wood products (which includes log home and timber frames)
- cabinets
- furniture
- pallets and containers
- other wood products
- shakes and shingles
- panelboards

Our definition of a “manufacturer” excludes several activities, the primary exclusions being “contractor/builders,” or “custom one-off operations.” The business types most affected are within engineered wood products, log home manufacturers, and cabinet firms. For example, a firm that manufactures pre-built houses in a plant and then ships them out for final assembly falls within our definition of “engineered wood products,” whereas a contractor or builder who constructs houses at a job site does not.

2. Research Methods

As part of our previous surveys, we have developed an inventory of British Columbia companies involved in secondary wood manufacturing. We updated this inventory using membership lists of producer associations, the Internet, and commercial directories, and through communication with industry experts and the ongoing survey process. For this survey, the target population of manufacturers included 589 firms. Although panelboard manufacturers were included in this survey, their results are only included in Section 5 (“Secondary Manufacturing Trends, 1990–2012”) because of their relatively small population size and issues related to confidentiality.

The two-part questionnaire used allowed us to obtain information on firms that would not complete the more detailed survey (see Appendix 2). Part A asked for information on company contacts, products, employment, species, and markets to support the publication of a product directory. Part B requested detailed information on mill location, products, markets, employment, plant capacity utilization, expansion plans, machinery, custom services, wood raw material use, species, source of lumber/log supply, sector challenges, sales, operating costs, and electronic commerce. To protect respondent confidentiality, results for Part B are presented only in aggregate form.

The survey was distributed in September 2013, with a follow-up several weeks later. Firms that did not respond to the faxes or mail-outs were contacted by phone or email between October 2013 and January 2014, and asked to complete and return the survey. A total of 242 sur-

veys were returned, representing a response rate of 41%. Although the number of respondents fell in 2012 so did the available target population, and therefore the response rate remained unchanged from 2006.

rial into semi-finished or finished products. Clustered by business type, the major wood products in the secondary manufacturing industry include the following:

We also exclude small one-off custom manufacturers of specialty furniture or cabinets. Finally, we exclude a small group of lumber/remanufacturing mills that are more lumber manufacturers than remanufacturers on account of their consumption of whole logs instead of raw lumber. Appendix 1 contains a reasonably comprehensive listing and logical taxonomy of the products produced in solid wood secondary manufacturing.

Table 2 summarizes the survey population and respondents by business type. Each firm in the survey population was classified into a business type according to its reported sales of specified product types (see Appendix 3 for the specific activities within our defined business types). The majority of firms were classified as “millwork” firms (24%) or “engineered wood products” (24%), and “remanufactured products” (18%).

The classification of firms into business types raises interesting questions. First, by maintaining the classification definitions from previous years, we are able to report on trends such as closures and openings over time, which may give insight into the impact of economic conditions. Nevertheless, as some business types (e.g., millwork, cabinets, and furniture manufacturers) engage in very similar work, aggregating these may have advantages. We also know that firms will change their products from time to time and thus move in and out of a particular business-type classification. For instance, remanufacturers may do more primary lumber production in a given year and therefore move out of that business type. Although this may indicate a falling number of remanufacturing firms, this is not necessarily because of a downturn in the demand for those products but rather the firm evolving its business.

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² In some cases, a company may have more than one enterprise involved in secondary manufacturing at different locations. These are treated as individual firms for the purpose of the survey.

Table 2. Survey population, response, and working sample

Business Type	Number of Firms		Response rate ^a
	Population	Respondents	
Cabinets	59	29	49
Engineered wood products	138	52	38
Furniture	51	17	33
Millwork	143	52	36
Other wood products	30	15	50
Pallets and containers	20	10	50
Remanufactured products	106	50	47
Shakes and shingles	28	9	32
Sub-total	575	234	41
Panelboards	14	8	57
Total	589	242	41

^aThe response rate is calculated by dividing the number of survey respondents by the population with 14 panelboard firms removed.

Sections 3 and 4 (i.e., “Survey Results” and “Results by Business Type”) present information provided by the survey respondents. Section 5 (“Secondary Manufacturing Trends, 1990–2012”) extrapolates these results to the total population, presenting estimates of population employment, sales, and raw material use. This method of extrapolation started with the 2006 survey (Stennes and Wilson 2008) and differed from our past surveys (Wilson et al. 1999; Wilson et al. 2001b). All companies contacted in follow-up phone calls were asked for the number of full-time equivalent employees. This elicited employee information for 85% of all firms in our population. For those firms that refused to provide employment information, or could not be reached, we estimated employee numbers from sample medians³. The employee numbers were then used to scale other variables of interest within each business type after developing coefficients per employee.

The survey was broadened in 1997 to include both panelboard producers and shake and shingle producers. Because such producers further process primary mill wood or wood-based material into semi-finished or finished products, both of these activities fit within our definition of secondary manufacturing (Wilson et al. 2001a). To facilitate comparisons with all of our previous surveys, some results in Section 5 (“Secondary Manufacturing Trends, 1990–2012”) were calculated net of these two business types. Selected results are reported using pre-2003 provincial forest region designations (see Figure 1), although most results were regionally disaggregated only on the basis of “Coast” versus “Interior.” However, in some cases, Coast and Interior regions are broken down into sub-regions, such that the Coast region is sometimes broken up into Vancouver–Fraser Valley and Vancouver Island–Coast, and the Interior region is broken up into Northern Interior (Northern and Cariboo forest regions) and Southern Interior (Kamloops and Nelson forest regions).

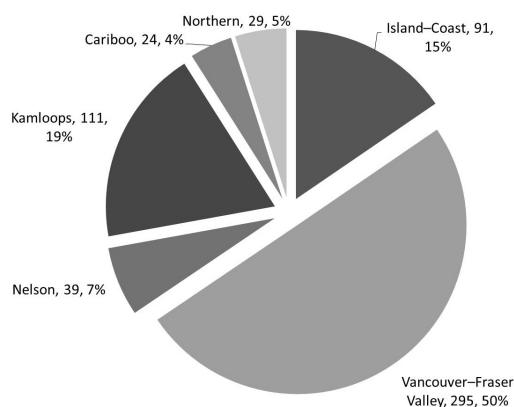


Figure 1. Location of British Columbia’s secondary wood manufacturers in 2012, showing number of firms and percentage of the survey population.

³Extrapolation is done using medians rather than means because the distributions for sales and employment are skewed toward a few large firms. Under these conditions, using means to scale up sample results would overestimate the true population parameters.

Table 3 summarizes the regional distribution of firms by business type. The majority of firms are located on the Coast (65%) and the rest are Interior operators (35%), primarily in the Kamloops (19%) and Nelson (7%) forest

regions. Of the firms on the Coast, about 75% are located in Vancouver–Fraser Valley area. The Interior had a higher proportion of engineered wood product firms (37%) and the Coast had a higher proportion of millwork firms (29%).

Table 3. Regional distribution of the survey population by business type

Business Type	Coast	Interior	Total
Cabinets	43	16	59
Engineered wood products	61	77	138
Furniture	42	9	51
Millwork	113	30	143
Other wood products	14	16	30
Pallets and containers	19	1	20
Panelboards	2	12	14
Remanufactured products	67	39	106
Shakes and shingles	25	3	28
Total	386	203	589
Percentage	66	34	

3. Survey Results

In this section, results from the 2012 survey are provided for employment, sales, raw material use, operating costs, markets, and capacity utilization and expansion plans. These results exclude information from panelboard producers.

3.1 Employment

Figure 2 shows the distribution of firms by region in 2012, with firms classified into three groups according to the number of employees. The median number of employees

is 15, but the average is close to 30. Over 40% of employment in the sector is with large firms (> 50 employees), and 16% of employment is at firms with 15 or fewer employees, although 55% of all firms were classified as “small.” The concentration of employment has fallen at firms with fewer than 50 employees to 58% in 2012, from 88% in 2006. Regionally, the Coast (dominated by the Vancouver–Fraser Valley area) accounted for 70% of reported employment, whereas firms in the Southern Interior employed 21%, and firms in the Northern Interior employed 8%.

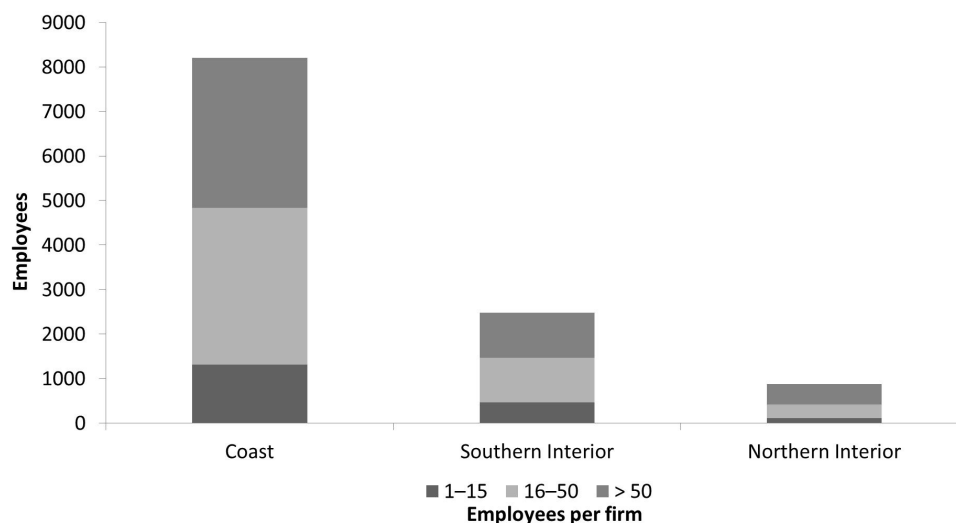


Figure 2. Number of employees in 2012 for firms with employment data (476 firms), by size of secondary manufacturing firm (employees per firm) and region.

Figure 3 clearly shows that small firms account for the majority of firms across all regions. The two areas that have the greatest proportion of large firms are Vancouver–Fraser Valley (23%) and Northern (30%). The presence of many

large firms within the Vancouver–Fraser Valley area, as well as the sheer number of firms (Table 3), highlights the concentration of secondary manufacturing in and around the province’s largest population centre.

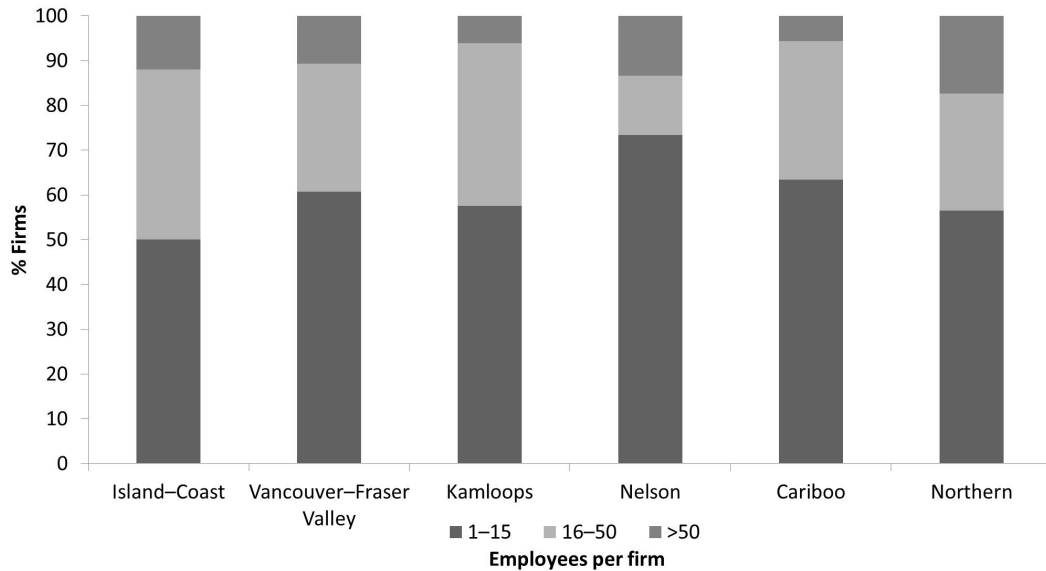


Figure 3. Geographical distribution of secondary manufacturing firms by size based on number of employees in 2012.

3.2 Sales

The majority of firms generate modest sales. For example, 37% of all firms had sales of less than \$1 million in 2012, whereas only 5% of firms had sales of more than \$24 million. Figure 4 shows that the relatively smaller firms

are spread across all the business types, with the greatest percentage of firms falling in the furniture and millwork categories. The engineered wood products, other wood products, and remanufacturing categories accounted for 10–20% of firms with sales of \$12 million or more.

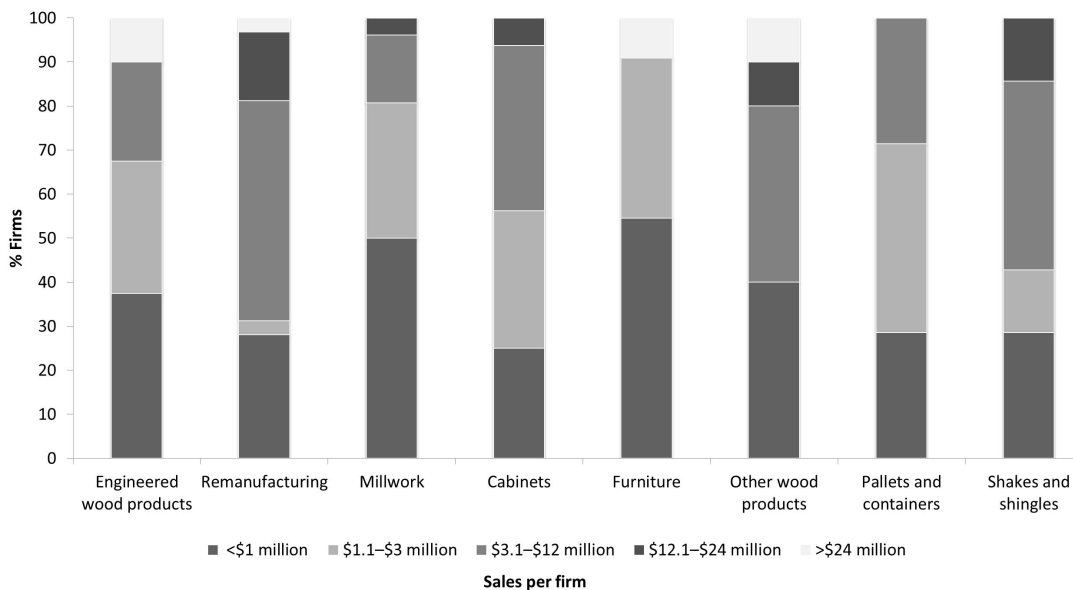


Figure 4. Sales revenue per firm in 2012, by secondary manufacturing business type (in \$ million Cdn).

3.3 Raw Material Use

As in previous surveys, the firms sampled for the 2012 survey were asked to identify their raw material inputs both in terms of form (i.e., logs, lumber, or panel products) and species. To facilitate comparison, fibre use was converted into roundwood equivalents.⁴ The sector (all business types) is estimated to have processed just over 20 million m³ of fibre in 2012⁵; this represents a decrease from the 2006 estimate of 25 million m³ and the 1999 estimate of 23.8 million m³. Lumber was the most utilized primary wood material input (58%).

Figure 5 shows that cedar and Douglas-fir were used most frequently by survey respondents, with 57% using some cedar or 53% using some Douglas-fir. In addition, a majority of firms (59%) indicated that they used some type of hardwood, which is up substantially from the 20% of firms indicating so in 2006. Cedar is the primary species (use $\geq 50\%$) for 29% of firms and Douglas-fir for 19% of firms. Spruce and lodgepole pine represent the primary fibre inputs for 11% and 7% of responding firms, respectively.

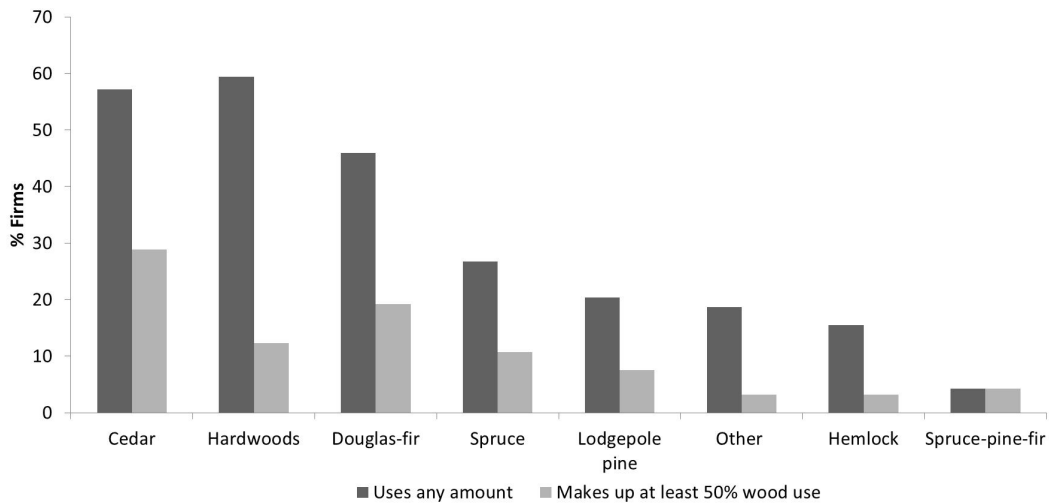


Figure 5. Raw material inputs used by secondary manufacturers in 2012, according to type of species.

Figure 6 shows that spruce-pine-fir accounted for the largest portion of roundwood equivalent at 31%, virtually unchanged from 2006, followed by cedar at 20%, which was down from 28% in 2006. The other notable difference from the 2006 survey is lodgepole pine, which was down to 11% in 2012 from its previous 18%. The remaining spe-

cies are spruce at 17%, Douglas-fir at 9%, and hemlock at 8%. The data in Figures 5 and 6 clearly show that the few firms using spruce-pine-fir lumber or other wood material tend to use it in large quantities. Conversely, many firms use small quantities of Douglas-fir and cedar.

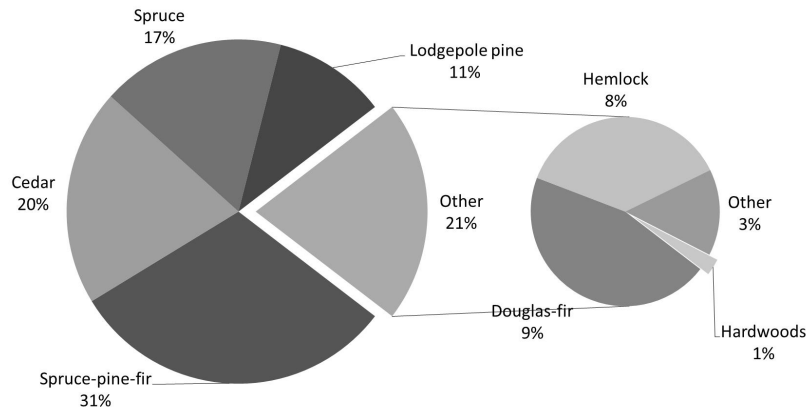


Figure 6. Tree species use by British Columbia's secondary wood manufacturers in 2012, showing total sector volume.

⁴Conversion factors are based on Nielson et al. 1985.

⁵A certain amount of double-counting is present in our roundwood equivalent estimates because some secondary manufacturers use, as their raw material, residuals produced by lumber manufacturers. As lumber accounts for approximately 60% of the raw material used by the sector, some of the feedstock would already be reflected in the estimates for lumber. We estimate that the double-counting is relatively minor, representing up to 2.3% of our roundwood equivalent estimate.

Secondary wood manufacturers in British Columbia have been very consistent over time in sourcing fibre locally, with the province's open market supplying nearly 91% of fibre purchases (see Figure 7). Other sources of fibre are from

the rest of Canada (3%), imports (3%), and other tenures (2%). Regionally, the Coast sourced 89% of the wood material from the open market versus 93% in the Interior.

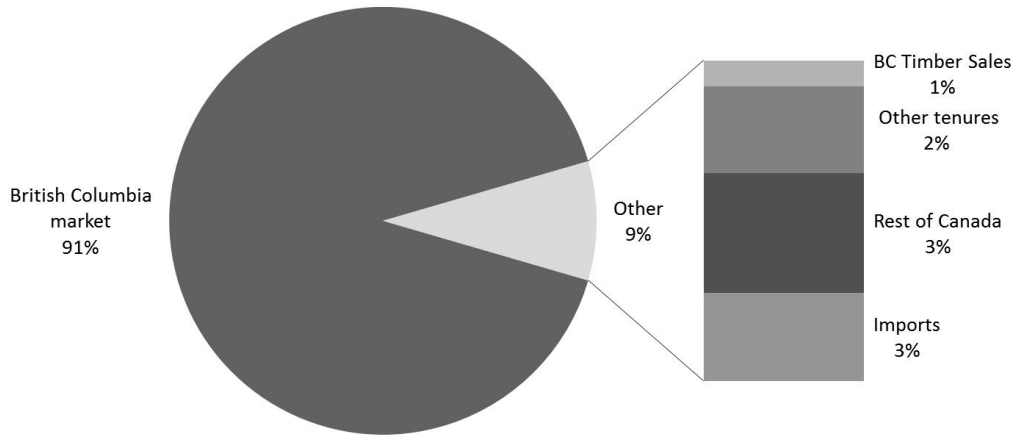


Figure 7. Sources of fibre supply for British Columbia's secondary wood manufacturers in 2012.

3.4 Operating Costs

Survey respondents were asked to list the proportion of their operating costs attributable to wood, labour, interest payments, depreciation, and other production costs.

Although proportions varied, simple averages of the responses revealed that the largest cost components that respondents faced were wood (35%), which was down from 41% in 2006, and labour (34%) (see Figure 8).

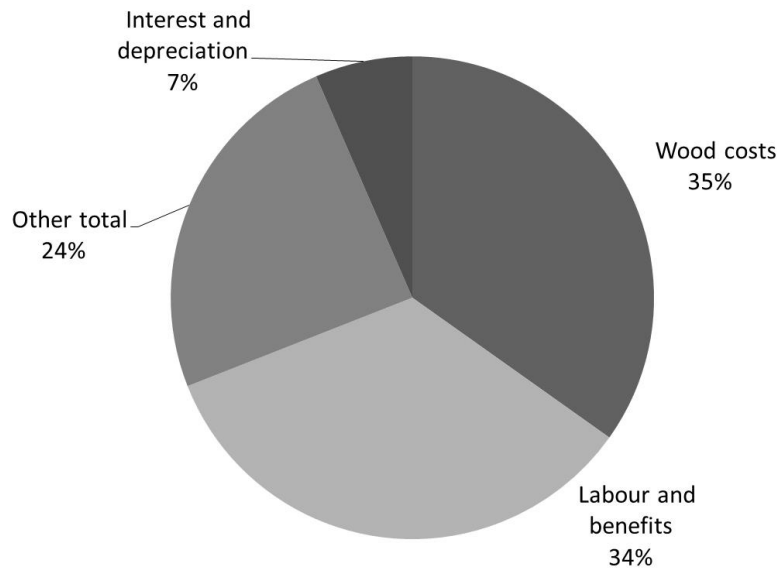


Figure 8. Breakdown of operating costs for British Columbia's secondary wood manufacturers in 2012.

3.5 Markets

British Columbia was the most important market for approximately 61% of firms responding to the 2012 survey, up from 46% in 2006. Figure 9 shows that virtually all firms (96%) reported some sales into the provincial market. This increase in provincial sales corresponds to a drop in sales

to the U.S. market; in 2006, 30% of the firms sold at least half of their shipments into the U.S. market, whereas 16% of firms had similar sales in 2012. Sales into other markets were also down but only somewhat from previous surveys. In the 2012 survey, the “Rest of Asia” emerged as a growing market, where 12% of firms had some sales (in 2006, “Rest of Asia” was part of the “Other” category).

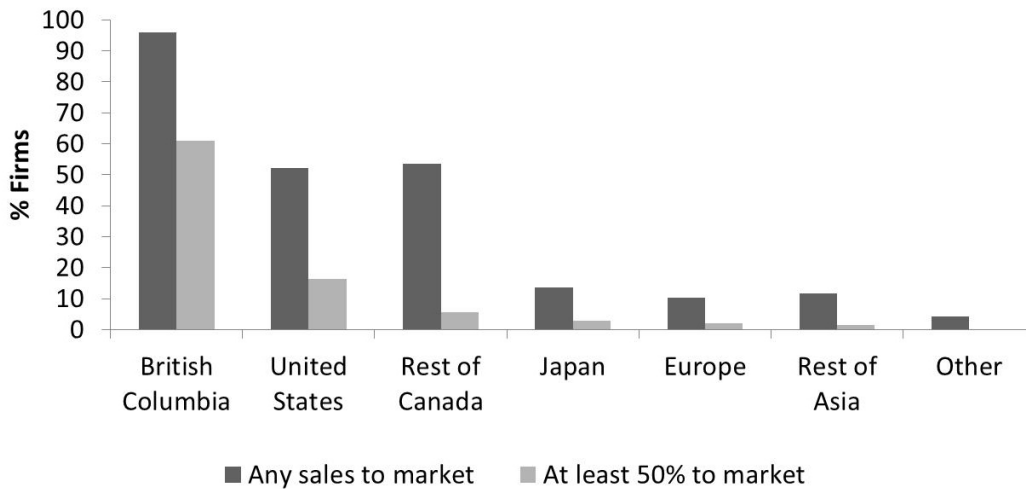


Figure 9. Percentage of firms reporting sales of secondary wood manufactured products to various markets in 2012.

Figure 10 shows that the majority of sales (60%) from the surveyed firms was to the domestic market, with 48% going to the British Columbia market and 12% to the rest of Canada. In 2012, sales to the United States were 20% of overall sector sales, down from 43% in 2006. The

percentage of sales to Japan and Europe were similar at approximately 6% and 10%, respectively. The rest of Asia accounted for 3% of sales in 2012; although more firms were finding markets in other parts of Asia, total sales were still modest.

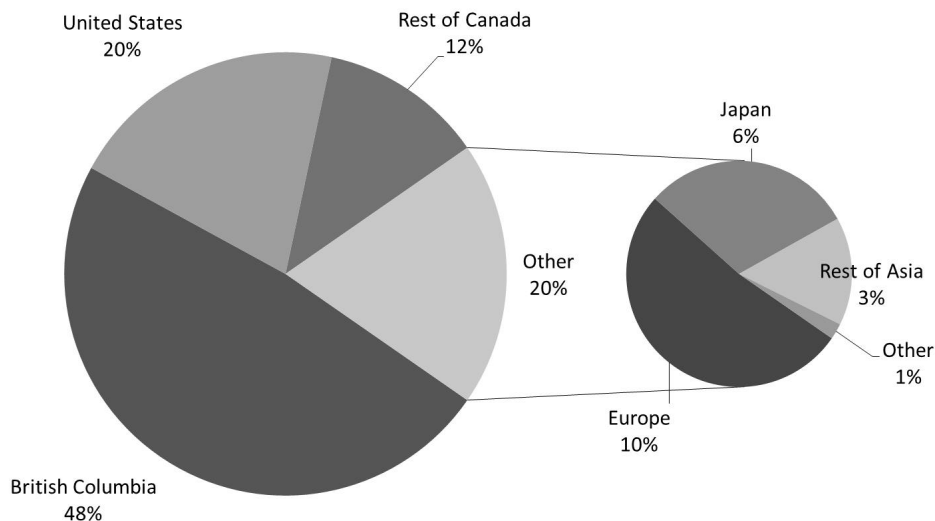


Figure 10. Proportion of total sales revenue (\$845 million Cdn) for secondary wood manufacturers in 2012 by market.

3.6 Capacity Utilization and Expansion Plans

Figure 11 shows that firms operated at an average capacity utilization level of 66% in 2012, down from 73% in 2006. Firms that operated two or more shifts (dominated by Inte-

rior firms) reported higher capacity utilization (81%); however, firms that operated one shift reported lower capacity utilization in the Interior (61%) than on the Coast (69%).

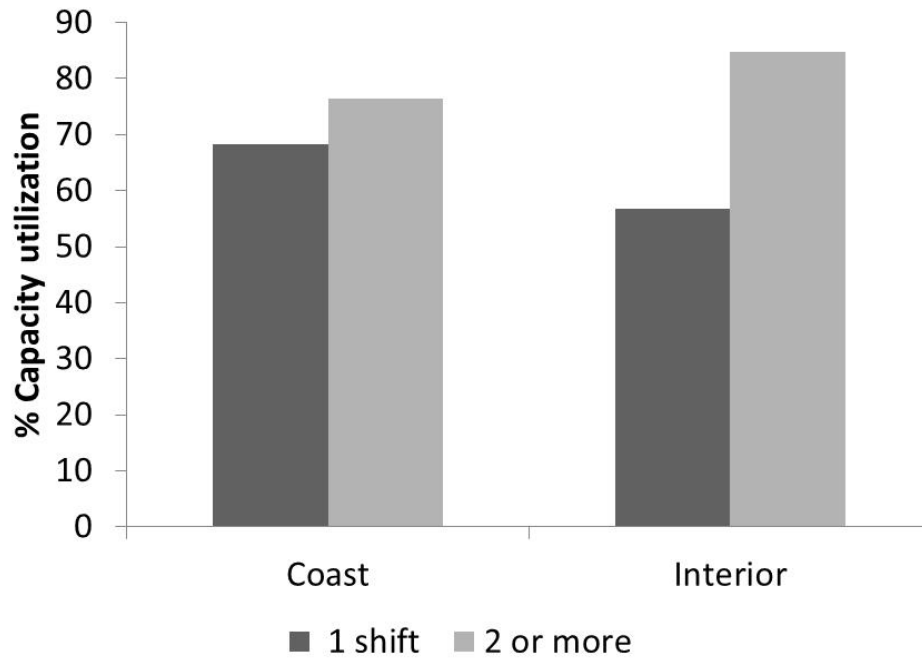


Figure 11. Percentage capacity utilization for secondary wood manufacturers in 2012, by region and number of shifts.

Over half of the responding firms planned to increase their capacity by an average of 45% during the 2013–2015 pe-

riod (Table 4). Coastal firms were generally less optimistic about future expansion plans.

Table 4. Expansion plans for Coastal and Interior firms

Region	Planning expansion ^a	Level of expansion
	% Firms	
Interior	59	59
Coast	52	36
Total firms	55	45

^a "Planning expansion" was calculated as the number of firms responding "yes" divided by the number of firms that responded to the question.

Survey respondents were asked to rank a predefined list of constraints to capacity expansion, using a five-point scale (where “1” equalled the “least constraining” and “5” equalled

“most constraining”). Figure 12 illustrates the respondents’ overall ranking of constraints to expansion, with the mean values of responses shown in descending order.

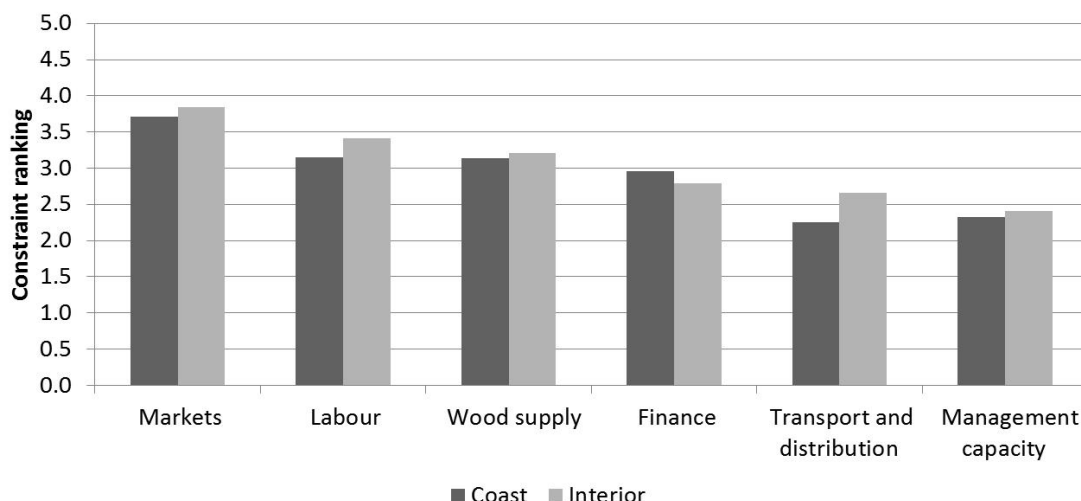


Figure 12. Survey respondents overall ranking of constraints to future firm capacity expansion by region (1 = least constraining, 5 = most constraining).

The most important constraints to capacity expansion among British Columbia’s secondary wood manufacturers have regularly been “Markets,” “Labour,” and “Wood Supply,” although the rank order of these three factors has changed over time. In 2012, for example, “Markets” were clearly ranked as the most important constraint, followed by “Labour” (means are significantly different at the 1% level) and very closely by “Wood Supply.” This is similar to the survey results obtained in 2000, when “Markets” were ranked as the largest constraint to expansion. “Labour,” which was ranked third in 2000, is now ranked second and seems to be more of an issue in the Interior than on the Coast (means are significantly different at the 10% level). Firms that have responded to the survey regularly indicate that “Finance” is less of a constraint. For the 2012 survey, we expanded the predefined list of constraints to

include “Transport/Distribution” and “Management Capacity,” both of which were considered by respondents as less constraining to expansion. It follows that transportation is less of an issue on the Coast given the availability of lower cost shipping by water versus the higher cost rail transport in the Interior (means are significantly different at the 5% level). This survey question did not distinguish between transport costs that were related to moving finished products to market and those related to bringing raw materials (e.g., fibre) to the mill. In the Interior, additional costs are required to transport the abundant beetle-killed fibre over increasingly greater distances.⁶

Within each of the survey’s constraint categories, respondents were asked to rate a more detailed set of constraints to expansion using the same methodology as described above. Table 5 outlines the results.

⁶Stennes and McBeath (2006) considered the issue of rising costs for bioenergy firms as fibre supply requirements grow. Future research could use data from this study to examine the implications of firm size in ranking transport costs as a constraint to expansion.

Table 5. Detailed constraints to expansion (1 = least constraining, 5 = most constraining)

Detailed constraint (provincial rank)	Coast	Interior	Provincial total
Wood supply			
(1) Price	3.69	3.28	3.52
(2) Quality/grade	3.19	3.53	3.32
(3) Price volatility	3.30	3.05	3.20
(4) Volume	2.94	3.14	3.02
Labour			
(1) Experience	3.48	3.82	3.62
(2) Cost	3.35	3.42	3.38
(3) Training/skills	3.21	3.58	3.35
(4) Flexibility	2.69	2.93	2.79
Markets			
(1) Market diversification	2.80	2.88	2.83
(2) Product diversification	2.51	2.73	2.60
(3) Market/product research	2.39	2.67	2.50
(4) Softwood lumber agreement (SWL)	2.44	2.24	2.36
(5) Foreign regulations other than SWL	2.00	2.04	2.02
Finance			
(1) Availability	3.02	2.83	2.95
(2) Cost	2.94	2.83	2.89
(3) Flexibility	2.90	2.73	2.83
(4) Repayment schedule	2.64	2.58	2.61
Manufacturing advice to:			
(1) Reduce manufacturing cost	3.94	3.80	3.89
(2) Increase labour efficiency	3.93	3.73	3.86
(3) Improve raw material recovery	3.14	3.18	3.15
(4) Improve product quality	3.06	2.84	2.97
(5) Implement lean/just-in-time manufacturing techniques	2.89	2.78	2.85
Transportation			
(1) Costs	3.57	3.60	3.58
(2) Access	2.69	2.99	2.81
(3) Logistics	2.67	2.66	2.67
(4) Frequency of service	1.91	2.02	1.95
(5) Lack of air service	1.40	1.52	1.45

The three most important constraints to expansion have consistently been wood supply, markets, and labour. Within the wood supply constraint, Interior respondents indicated that the most important factors were wood material price and wood quality and grade; on the Coast, price was the most important factor. Within the labour constraint, experience was the most important for all respondents,

followed closely by cost and training and skills. Within the markets constraint, market and product diversity had the highest rankings across the province. In the area of finance, the availability of finance was ranked at the top. Further analysis may indicate whether firm size results in significant differences in how finance constrains expansion.

4. Results By Business Type

4.1 Plant Size

Figure 13 shows the relative size of firms in each business type based on number of employees. Overall, more than 50% of the survey respondents were classified as “small” firms with fewer than 15 employees. Although this finding is consistent with the responses for sales by business type (see Figure 4; i.e., smaller firms who reported less than \$3 million Cdn in gross revenue for 2012 generated 60% of

all secondary wood manufacturing sales), the number of small firms (as measured by employees) responding to the 2012 survey has fallen compared to the number of medium and large firms. Typically, only the remanufacturing and shake and shingles business types have less than 50% of the firms in the “small” category; however, in the 2012 survey, small firms make up fewer than 50% of cabinet, furniture, and the other wood product business types.

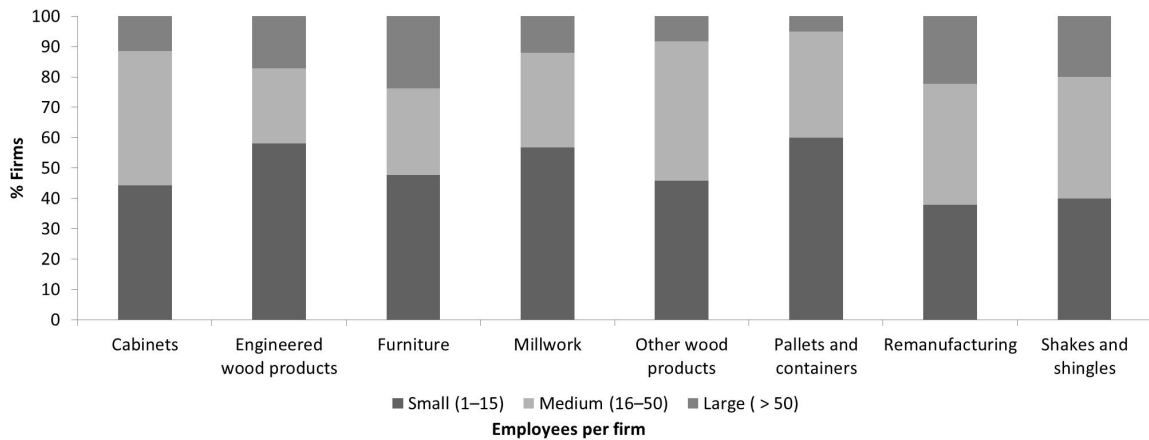


Figure 13. Relative size of responding firms by business type, based on number employed in 2012.

4.2 Sales Revenue

Figure 14 shows the average change in sales revenue from 2011 to 2012 by business type. Provincially, all business types averaged a 14% increase in revenue during this period. By far the largest sales gains were experienced by

firms in the “other” wood product business type, which are dominated by fuelwood pellet producers. Most firms were expecting sales to improve by an average of 8% in 2012–2013, although furniture manufacturers were expecting a 10% reduction.

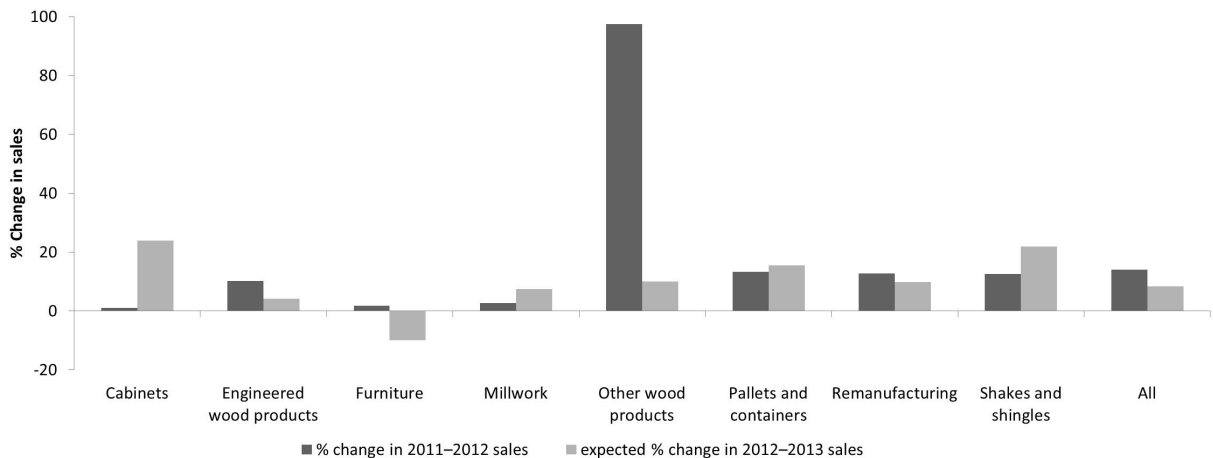


Figure 14. Percentage change in sales revenue (2011–2012) for responding firms and expected change (2012–2013).

Figure 15 shows that the market mix varies considerably between the different business types, with shake and shingle firms selling the highest overall percentage into the U.S. market. Firms selling pallets and container firms, remanufactured products, engineered wood products, and shakes and shingles have traditionally sent large proportions of their output (40% or greater) to the United States, although 2012 sales decreased considerably, dropping below the 40% level for these business types. British Colum-

bia sales were traditionally (see Stennes and Wilson 2008) a mainstay for both cabinet and millwork firms, who sold over 60% of their output provincially in 2006; for 2012, this increased to 80% for cabinet firms and 77% for millwork firms. Across business types, firms relied on the provincial market to buoy sales over 53%, on average, in 2012, although this excludes the “other” business type dominated by pellet firms with strong European markets.

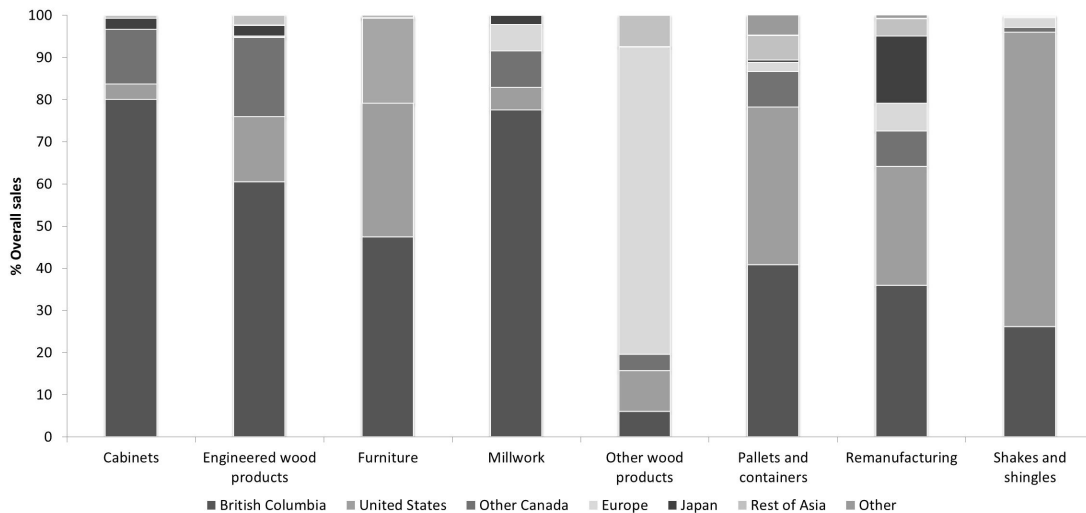


Figure 15. Breakdown of overall sales by responding firms to markets, according to firms' business type in 2012.

4.3 Fibre Use and Operating Costs

Table 6 shows species use across business types. Cedar was the sole feedstock for shake and shingle firms and was also heavily used (30%) by remanufacturing firms. Spruce-pine-fir is the major species mix used by firms in the “other” wood product category. Remanufacturing, engineered

wood products, and pallet and containers firms used the greatest variety of species, with only hardwoods not readily used. Douglas-fir is an important species for engineered wood product and millwork firms. Cabinet and furniture firms used the greatest amount of hardwoods, totalling over 56% of their fibre supply.

Table 6. Percentage of species used by responding firms' business type in 2012

Business Type	Spruce-Pine-Fir	Cedar	Spruce	Lodgepole Pine	Douglas Fir	Hemlock	Other	Hardwoods
Cabinets	0	3	0	0	2	0	22	73
Engineered wood products	3	5	21	21	29	11	11	0
Furniture	0	0	0	0	15	22	10	53
Millwork	0	7	3	3	50	3	2	32
Other wood products	83	5	4	1	4	0	3	0
Pallets and containers	6	3	39	12	21	20	0	0
Remanufacturing	15	30	23	14	7	10	1	0
Shakes and shingles	0	100	0	0	0	0	0	0
All businesses	31	20	17	11	10	8	3	1

The importance of the different inputs to overall operating costs for secondary manufacturing firms varies widely across business types. For example, Figure 16 shows that wood costs go from a high of 56% and 49% for shake and shingle firms and remanufacturers, respectively, down to a low of 31% and 22% for engineered wood products and

cabinet firms, respectively. Labour costs range from 30 to 39%, making up the largest proportion of operating costs for the responding furniture firms and the lowest proportion for remanufacturers. Interest and depreciation averaged 7% of total costs across all business types.

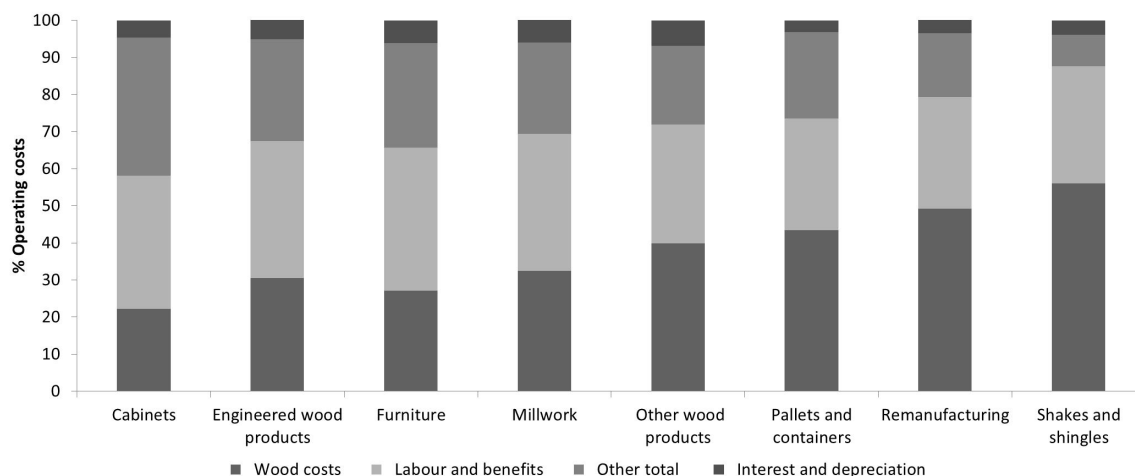


Figure 16. Operating costs for British Columbia secondary wood manufacturers by business type in 2012.

4.4 Constraints to Expansion

Figure 17 examines the constraints to expansion by business types, showing the level of importance that the survey respondents placed on markets, labour, and wood supply. For every business type, firms identified labour as a moderate constraint (i.e., between 3 and 4 on the five-point constraint scale, where 1 is least constraining and 5 most constraining). In 2006, labour was the top constraint

for those firms that serviced the building sector (e.g., the cabinet, engineered wood product, and millwork business types). In 2012, market issues emerged as the top constraint for firms in those three business types, as well as for the pallet and container producers, and remain high for the remanufacturing firms. Wood supply and labour were the top constraints for shake and shingle and remanufacturing firms.

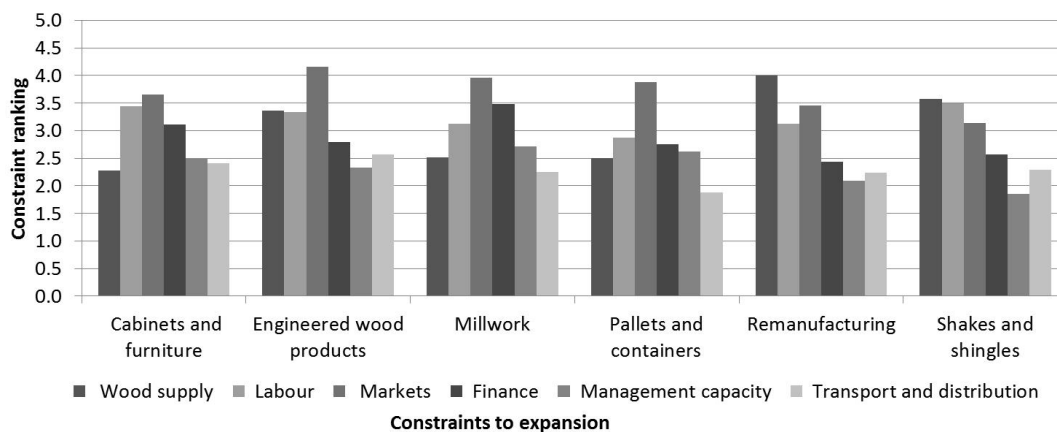


Figure 17. Constraints to secondary wood product firm expansion by business type in 2012.

4.5 Electronic Commerce

The survey contains four questions related to electronic commerce. Respondents were asked whether their firm: (1) had a website; (2) sold products over the Internet; (3) searched for, or purchased, inputs over the Internet; and (4)

searched the Internet for manufacturing advice. In an addition to the 2012 survey, respondents were asked whether their firms had adopted social media as a platform for commerce. Figure 18 summarizes the responses to these questions.

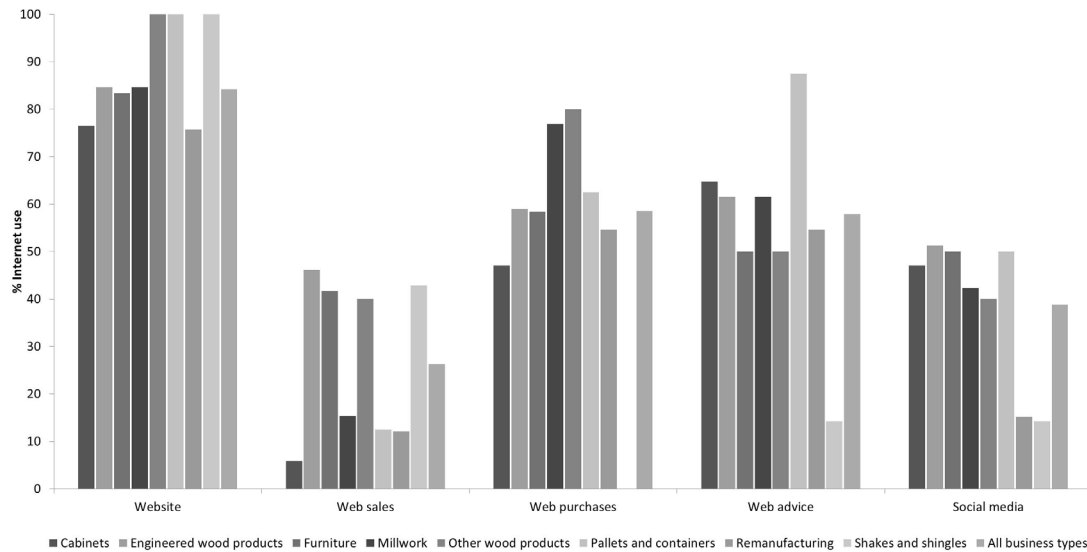


Figure 18. Internet use by British Columbia secondary manufacturing firms in 2012.

These results are consistent with an economy-wide trend to the increased use of computing technology and creative use of the Internet. Overall, 84% of responding firms had a website in 2012, up from approximately 75% in 2006 and 50% in 2000. Twenty-six percent of firms used the Internet to sell products, up 2% from the previous two surveys. Fifty-nine percent of firms used the Internet to purchase inputs, up from 55% in 2006 and 47% in 2000. Close to

60% of responding firms searched the Internet for manufacturing advice in 2012, compared to approximately 50% in 2006. Of note is the overwhelming popularity of web advice amongst the pallet and container firms. Firms are also beginning to use social media for some purpose in their manufacturing business, with an average use of close to 40% across all business types.

5. Secondary Manufacturing Trends, 1990–2012

The Canadian Forest Service has conducted a survey of secondary wood product manufacturing in British Columbia since 1990. The resulting dataset now contains information spanning 22 years that reveals changes in both the sector's scale and composition. Here we examine some of the sector's emerging trends (1990–2012) by extrapolating our latest survey results to the total population of solid wood product manufacturers, presenting estimates of employment, sales, and raw material use. As our earlier surveys did not include shake and shingle or panelboard producers, these two business types are (for the most part) excluded from the analysis to facilitate comparisons.

5.1 Sales and Jobs

Compared to data from the 1999 survey, remanufacturing is no longer a clear leader within British Columbia's secondary wood product manufacturing sector (Table 7). Panelboard producers now share the lead, rising to first place in relative sales, although these firms have fallen to fourth place overall (from 31% to 24%) in jobs. For remanufacturers, the 1999–2012 fall in economic contribution is greater for sales (i.e., from 36% to 20%) than for employment (i.e., 32% to 21%).

Table 7. Percentage economic contribution (% of total) by business type in 2012

Business Type	1999 Survey		2012 Survey	
	Sales	Jobs	Sales	Jobs
Remanufactured products	36	32	20	21
Engineered wood products	14	18	19	19
Cabinets	2	4	6	9
Furniture	3	6	5	8
Millwork	4	9	15	18
Other wood products	1	2	7	4
Pallets and containers	1	1	2	2
Shakes and shingles	7	9	3	3
Panelboards	31	20	24	17

The fall in the relative share of sales and jobs for remanufacturers and shake and shingle producers from 1999 to 2012 is taken up by gains in six of the sector's other business types. For example, firms engaged in the manufacture of engineered wood products, cabinets, furniture, millwork, other wood products, and pallets and containers have all seen increases in share of total sales and jobs.

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Figure 19 shows employment trends (in full-time equivalents) over the last 22 years. In 2012, the aggregate employ-

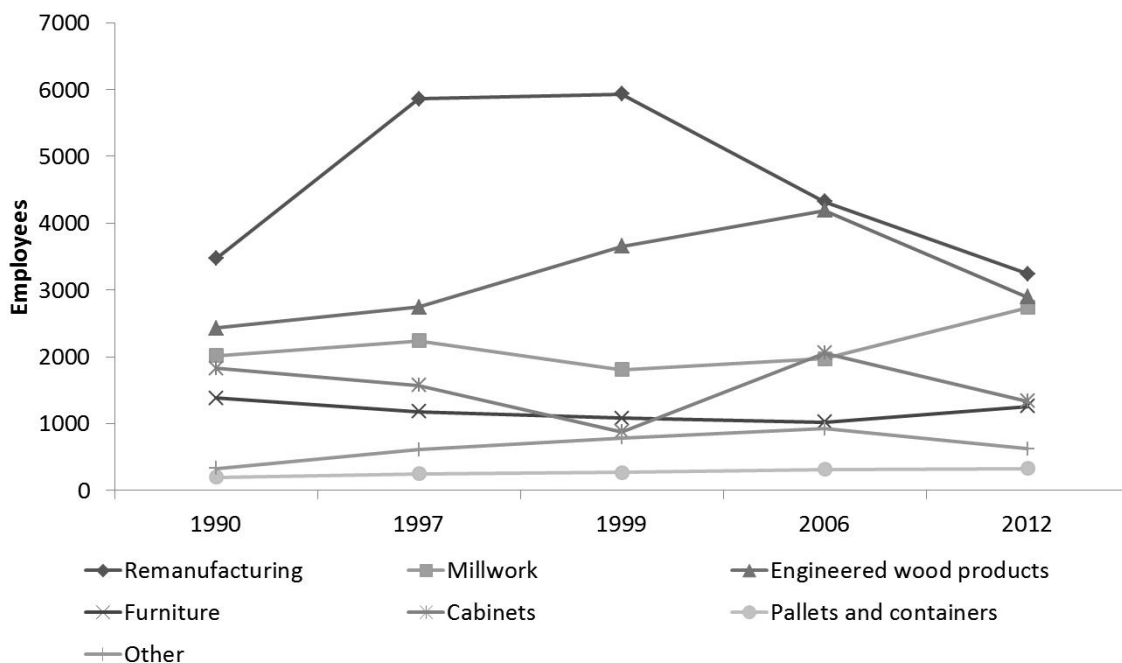


Figure 19. Trends in number of employees by business type, 1990–2012.

The increasing average size of firms noted in the 2006 survey has now stabilized. In 2012, the composition of firms by sales was little changed (see Figure 20). Close to 90% of

sales are generated by firms in the medium and small size categories.

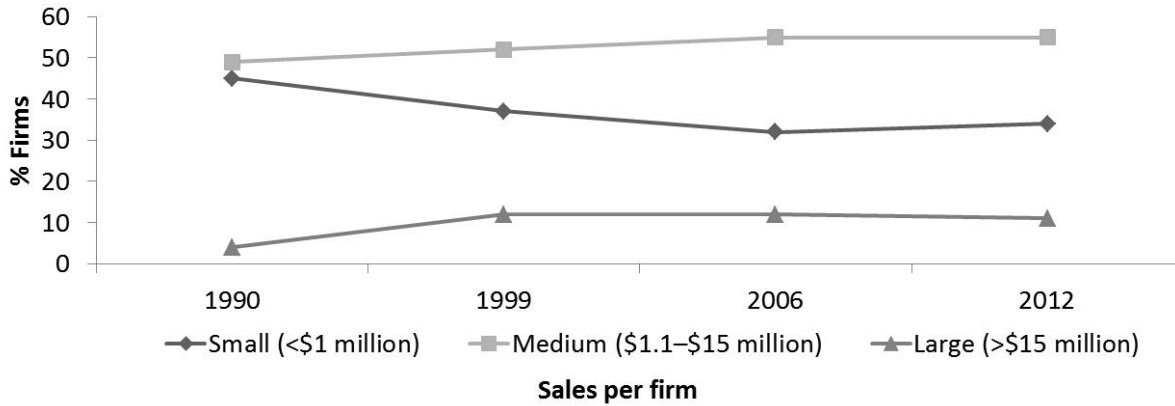


Figure 20. Trends in gross sales revenue for 1990, 1999, 2006, and 2012 (excludes panelboard and shake and shingle producers).

Figure 21 illustrates trends in fibre inputs for the past four surveys (1997, 1999, 2006, 2012).⁷ Spruce-pine-fir, the most important species mix used in secondary manufacturing since the 2006 survey, showed the largest increase in use over the last two surveys. Cedar showed the largest decrease in use; this species, which accounted for nearly 40% of the volume used as fibre inputs in 1997, dropped to approximately 20% in 2012. This reflects the results shown in Figure 15—shake and shingle producers, who

were strongly dependent on the now weaker U.S. market, obtained 100% of their fibre input from cedar (Table 6). The proportion of lodgepole pine used has also dropped, whereas the use of Douglas-fir, spruce, and hemlock has increased. Some lodgepole pine use is likely captured under “spruce-pine-fir” in the survey responses of firms engaged in the manufacturing of other wood products; for example, pellet firms use sawmill residuals that may be labelled as “spruce-pine-fir” but that includes some lodgepole pine.

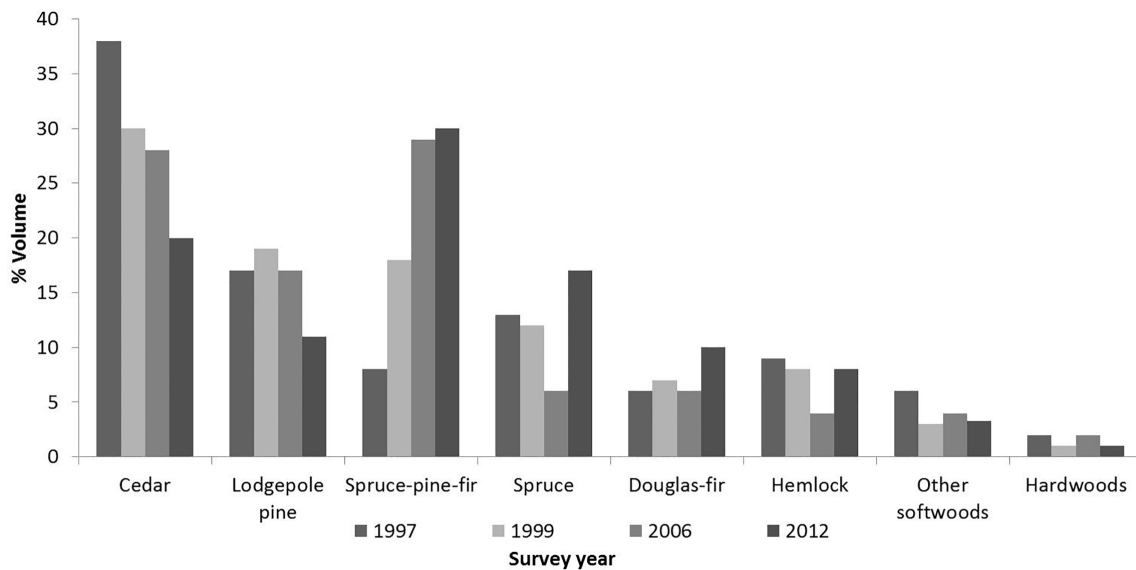


Figure 21. Trends in overall species use, 1997–2012 (excludes panelboard producers).

⁷For the 1997 and 1999 results, the volume of species use attributed to panelboard producers were netted out, as this business type was not surveyed in 2006.

Figure 22 shows that, starting in 2006, the proportion of sales to domestic and export markets had started to change. Throughout the 1990s, the greatest growth was seen in increased exports to the U.S. market.⁹ This shifted between 1999 and 2006 surveys, with sales into the United States falling and those into the local British Columbia market increasing. The 2012 survey showed this trend continuing, with the U.S. market share declining again but somewhat offset by increased sales to the provincial market. Indeed, increasing sales into the domestic market has offset decreases in every other market except Europe,

where both the 2006 and 2012 survey results showed an increase. The Asian market decline that began in the mid-1990s has also seen a reverse. Together these trends highlight the effect of the U.S. housing recession on British Columbia's secondary wood product manufacturing sector, particularly firms closely tied to this market such as those producing remanufactured lumber, panels, and shakes and shingles. It also serves to highlight how sales to domestic markets anchored many businesses during this turbulent period.

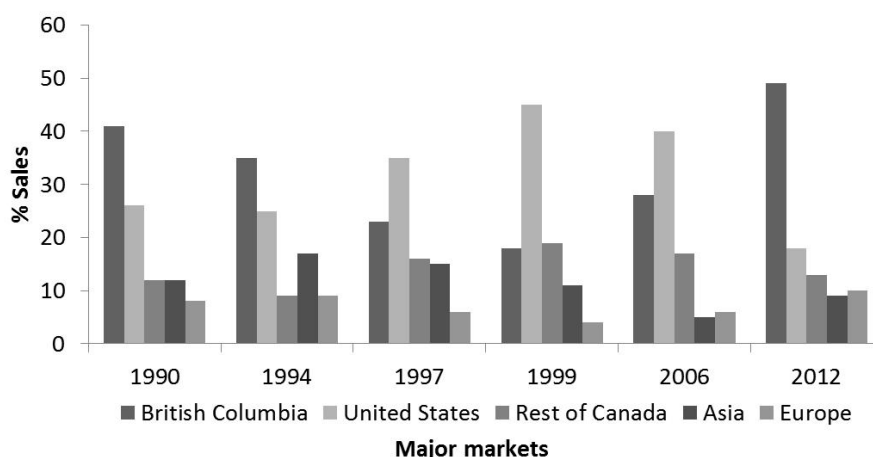


Figure 22. Trends in overall sales to major markets for British Columbia secondary manufacturing products, 1990–2012 (excludes panelboard and shake and shingle producers).

5.2 Capacity and Expansion

Questions on capacity utilization and plans for expansion have been included in the secondary wood product manufacturing survey since 1994. Figure 23 shows that capacity utilization has remained mostly static for the past

13 years, although utilization dropped to 66% in 2012. The 1990s saw both an increase in the number of firms that planned to expand their manufacturing capacity and in the amount (%) by which firms planned to expand; since 1999, however, fewer firms have been interested in expansion.

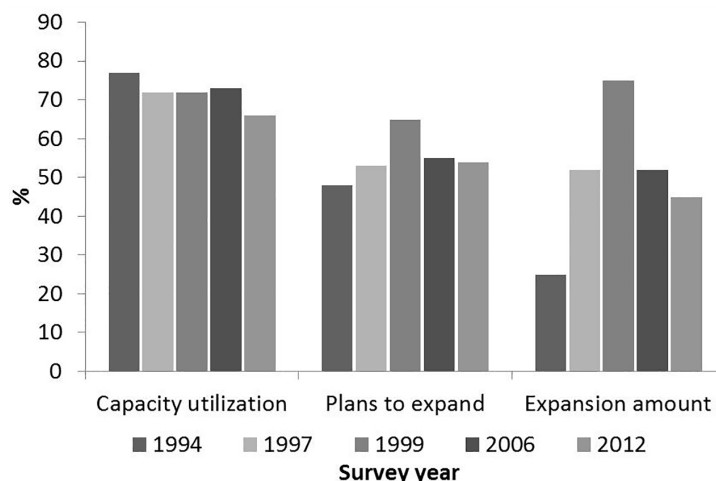


Figure 23. Trends in capacity utilization and expansion plans for British Columbia secondary wood manufacturers, 1994–2012.

⁹Through the 1990s, the total value of sales grew in all markets except Europe.

Table 8 shows how constraints to expansion of secondary wood product manufacturing have changed over the past three surveys. In 2006, labour was the most important constraint to expansion, but this constraint dropped back to third place in 2012. Survey results for 2012 show that developing markets was clearly one of the greatest challenges facing many of British Columbia's secondary wood product manufacturers, with this constraint gaining back

the first place ranking it had in 1999 (Stennes et al. 2005). In fact, when compiling the sample population for the 2012 survey, we discovered several service firms geared to marketing and sales of secondary manufacturing products, indicating the greater scope these specialty businesses now have and the existence of enhanced policy and programming support available to help small- and medium-sized businesses find new markets.

Table 8. Ordinal ranking of constraints to expansion for secondary manufacturing in British Columbia, 1999, 2006, 2012

Constraint	Ranking		
	1999	2006	2012
Labour	4	1	2
Wood Supply	2	2	3
Markets	1	3	1
Finance	3	4	4

Table 9 shows trends in the three main indicator variables from our surveys—number of firms, gross sales revenue, and employment. The public policy goal of increasing solid wood product manufacturing activity was realized in the 1990s, when the magnitude of all three indicators increased; however, the results show that this growth has now levelled off. For example, between the 1999 and 2006 surveys, gross sales fell by 7% (adjusted for inflation;

excluding shake and shingle and panelboard producers),⁹ and since the 2006 survey, sales (nominal dollars) fell by 22%, employment levels by 21%, and the number of firms by 20%. In addition, the volume of wood (roundwood equivalents) that flowed through the sector fell from 25 million m³ to 20 million m³, which is consistent with the drop in the number of firms, sales, and employment.

Table 9. Trends in number of firms, gross sales revenue, and employment for British Columbia's secondary wood product manufacturing sector, 1990–2012

	1990	1994	1997	1999	2006	2012	% change (2006-2012)
Excluding shake and shingle and panelboard firms							
Firms	565	525	683	703	660	547	-17
Sales	1.54	1.93	2.69	2.9	3.15	2.8	-11
Employment	11 660	14 010	14 460	14 410	14 800	12 417	-16
All business types							
Firms	–	–	774	774	732	589	-21
Sales	–	–	3.87	4.68	4.88	3.82	-22
Employment	–	–	19 490	20 190	19 670	15 576	-21

⁹From Stennes and Wilson (2008): 1999 estimates of sales converted to 2006 dollars were found to be \$3.4 billion as compared to the 2006 sales of \$3.15 billion (using the implicit GDP price deflator) for a percentage change of 7.3%.

6. Summary and Conclusions

The 1990s saw strong growth in the secondary wood product manufacturing sector in British Columbia, with increases in the number of firms, gross sales revenue, and employment levels. This growth stalled in 2006, with 2012 as the second consecutive survey showing a downward trend in the sector's key indicator variables.

The 1990s also saw strong growth in sales to our most important export market, the United States (Stennes et al. 2005), with the three top business types in sales volume—remanufacturing, engineered wood products, and panelboards—all relying on this market. As a result of the 2009 U.S. recession, however, sales growth has shifted to the domestic British Columbia market, with the business types that depend most heavily on the local market (i.e., cabinet and furniture makers and millwork firms) performing better than those more reliant on sales to the United States. Firms using mill residuals, most notably wood pellet producers whose sales are primarily to Europe, have increased their relative share of the “Other Wood Product” business type and reversed a declining trend seen in our earlier surveys of sales to that export market.¹⁰ In general, many of the firms we surveyed in 2012 expected to expand sales over the 2013–2015 period, although the responding firms identified markets, labour, and fibre supply as the top constraints to growth facing the secondary wood product industry.

Geographically, most secondary wood product manufacturing activity still occurs in the more urban areas of the lower mainland and the Okanagan; however, some business types are more prevalent in rural, forest-dependent areas, including log home and timber frame businesses, as well as finger-jointing and wood pellet producers, which use low-value fibre from sawmills. Future studies will investigate why secondary manufacturing firms tend to locate near urban areas rather than near the wood supply. This research question is especially relevant in British Columbia's Interior, which has faced a restructuring of the primary sector linked to the effects of the mountain pine beetle infestation on timber volume and quality.

Over the last decade, policy makers have struggled to respond effectively to the effects of timber supply shocks and competitive global markets (Wilson 2000). Nevertheless, considerable interest remains in promoting the sustainable growth of value-added processing as a means to maximize the level of economic activity from each unit of fibre harvested in the province. By providing accurate and timely information on the existing structure and dynamics of secondary wood product manufacturing in British Columbia, this survey and subsequent updates will allow for a comprehensive assessment of various options, greatly benefitting future policy responses.

¹⁰ See Stennes and McBeath (2006) for an examination of the factors contributing to this flow of fuel pellets.

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Appendix 1: Taxonomy of secondary manufactured wood products^a

Log products	Wood products		
	Primary	Intermediate	Final
Chopsticks	Boards	Building/home	Boxes, bins and crates
Firewood	Cants	Components	Cabinets
House logs	Flitches	Cutstock	Coffins
Pilings	Lumber/Industrial timber	Door stock	Countertops
Poles	Treated timber	Edge glued components	Decking
Posts	Veneer	Finger-jointed stock	Fencing
Log homes		Furniture components	Finger-jointed lumber
Shakes		Joinery stock	Flooring
Shingles		Ladder stock	Flooring/Engineered
Treated pilings		Laminated components	Furniture/Commercial
Treated poles		Laminated stock	Furniture/Household
Treated posts		Metric stock	Furniture/Patio
Novelties		Moulding, panel blanks	Furniture/RTA
		Pallet, crating stock	Garden buildings/products
		Medium density fibreboard	Laminated veneer lumber
		Particleboard	Millwork/Architectural, custom
		Pattern stock	Medium density fibreboard
		Sawmill specialty products	Mouldings
		Staircase components	MSR lumber
		Turning squares	Oriented Strandboard
		Window stock	Pallets
			Paneling
			Plywood
			Prefab buildings and manufactured homes
			Siding
			Staircases
			Stakes, lathe, strips and batten
			Structural laminated beams
			Treated lumber
			Trusses
			Turned wood products
			Windows
			Wood novelties
			Wood pellets

^aThis taxonomy is based on Wilson and Ennis (1993).

^bThis column does not include secondary products but is inserted to provide a more complete taxonomy.

Appendix 2: 2012 survey of secondary wood product manufacturing in British Columbia

There are two parts to the survey. Part A asks for basic information to support the publication of a British Columbia secondary manufacturing company/product directory.

Please fill out Part A regardless of whether or not you fill out part B.

The information in Part B will not be reported for individual companies, but will be used in aggregate to develop important up-to-date information on this sector such as the economic contribution and the identification of important constraints to growth.

Part A

Company Name:

Mailing Address:

Name of Contact Person:

Mr. Ms. _____

Phone () _____ Fax () _____

Email _____

1. Will you be completing PART B of the questionnaire?

Yes No

2. Do you want the company/product directory sent to you?

Yes No

3. Do you want a copy of the final report sent to you?

Yes No

4. Please check the Business Type that accounts for the majority (greater than 50%) of your 2012 sales revenue.

- Roundwood mill (commodity, specialty, shakes/shingles)
- Reman products (FJ, lumber specialties, fencing, panels)
- Engineered wood products (glulam, LVL, I-joists, laminated posts/beams, trusses, prefab buildings, log homes, treated wood)
- Millwork (doors, windows, architectural and custom woodwork, turned wood products, mouldings)
- Cabinets (kitchen/vanity cabinets, cabinet doors, countertops)
- Furniture (household, RTA, commercial, institutional and patio)
- Pallets and containers (pallets, boxes, bins, crates)
- Plywood & Panelboards (net of veneer production)
- Other (please specify) _____

5. List the major products manufactured at your plant

- (a) _____
- (b) _____
- (c) _____
- (d) _____

6. Which custom services do you provide? Please check.

- Kiln Drying Planing Resawing
 Other (specify) _____

7. Estimate the average number of full-time equivalent employees in 2012. A full-time equivalent is 220 or more days worked in the year.

_____ Full Time Equivalent Employees
_____ Production Staff
_____ Non-Production Staff

8. What are your current market areas?

- BC Canadian Prairies Eastern Canada
 US West US Midwest US South US Northeast
 Europe Japan Korea
 China Other (please specify)

9. Please indicate new market areas of interest.

10. Identify the top five species used (measured in volume terms).

Part B

No information collected in Part B will be reported on an individual company basis. Some questions in Part A are repeated in Part B to allow value-added industry level analysis.

Location:

1. Please give the location of the mill/plant where the site is located.

Products and Services:

- 2a. List top 4 products manufactured and indicate approximate % of 2012 total sales revenue.

- (a) _____ %
(b) _____ %
(c) _____ %
(d) _____ %
(e) others _____ %

Total 100 %

- 2b. Which custom services do you provide? Please check.

- Kiln Drying Planing Resawing
 Other (specify) _____

Markets:

- 3a. List 2012 market areas (based on % of total sales revenue).

- BC _____% Other Canada _____% US _____%
Europe _____% Japan _____% Rest of Asia _____%
Other (please specify country & % of sales)
_____ %
_____ %
Others
_____ %
Total 100 %

- 3b. If you sell into BC, estimate the percentage of your BC sales that are to wholesalers and consolidators.

_____ %

- 3c. What end markets do you target for your products?

- New Residential Remodeling Multiple unit Housing
 Industrial buildings Industrial uses Commercial buildings
 Other _____

Employment & Production Inputs:

4. Please provide the average number of full-time equivalent employees in 2012. A full-time equivalent is 220 days or more worked in the year.

_____ Full Time Equivalent Employees
_____ Production Staff
_____ Non-Production Staff

5. Estimate volume of wood raw material used in 2012?

- Logs (m³)
- Lumber (1,000 fbm)
- Plywood (Sq. Ft. 3/8" basis)
- OSB (Sq. Ft. 3/8" basis)
- Other (please specify what & units):
material _____
volume & units _____

6a. Sources of lumber/log supply (either direct supply or in the form of lumber or log trades) in 2012 (approximate) percent:

- BC market purchases _____ %
 - Canadian purchases but outside of BC _____ %
 - BC Timber Sales _____ %
 - Other tenures _____ %
 - Imports from outside Canada _____ %
- Total 100 %

6b. If sourced from outside BC or Canada, where are your logs sourced from and which species?

7. Estimate species use by % of total volume:

- lodgepole pine _____ % spruce _____ %
 - balsam _____ % Douglas fir _____ %
 - hemlock _____ % cedar _____ %
 - Other softwoods (specify species & %)
_____ %
_____ %
_____ %
 - Hardwoods (specify species & %)
_____ %
_____ %
_____ %
- Total 100 %

Capacity Utilization & Constraints:

8a. Approximately what percentage of capacity was the plant operating in 2012?

_____ %

8b. Was this a:

- 1 shift basis 2 shift basis
- Other (specify) _____

9a. Do you plan to expand manufacturing capacity over the three-year period 2013–2015?

- Yes No

9b. If yes, by what total % do you plan to expand capacity in this three-year period?

_____ %

10a. Please rank the following possible constraints to capacity expansion for your firm from 1 to 5 where 1 = least constraining and 5 = most constraining).

	Least				Most
	1	2	3	4	5
Wood supply	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Labour	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Markets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Finance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Management Capacity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Transportation/Distribution	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (specify below)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

10b. Please rank each of the following factors that may constrain your capacity to expand your firm from 1 to 5 where 1 = least constraining and 5 = most constraining).

i. Wood Supply (please rank the following)

	Least				Most
	1	2	3	4	5
Volume	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Price	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Quality/Grade	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Price Volatility	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (specify below)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

ii. Labour (please rank the following)

	Least				Most
	1	2	3	4	5
Training/Skills	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Flexibility	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cost	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Experience	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (specify below)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

iii. Markets (please rank the following)

	Least				Most
	1	2	3	4	5
Softwood Lumber Agreement (SWL)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Product Diversification	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Market Diversification	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Market/Product Research	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Foreign regulations other than SWL	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (specify below)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

iv. Financing (please rank the following)

	Least				Most
	1	2	3	4	5
Availability	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cost	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Flexibility	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Repayment schedule length	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (specify below)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

v. Manufacturing Capacity (please rank the following)

	Least				Most
	1	2	3	4	5
Improving Product Quality	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Reducing Manufacturing Costs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Increasing Labour Efficiency	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Improving Raw Material Recovery	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Implementing Lean/Just-In-Time Manufacturing Techniques	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

vi. Financing (please rank the following)

	Least				Most
	1	2	3	4	5
Cost	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Access	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Logistics	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of air service	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Frequency of Service	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (specify below)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

vi. Other constraints (specify) _____

Sales and Operating Costs:

11. Approximate 2012 gross sales revenue (FOB mill – C\$).

- Less than 250 thousand
- 250–500 thousand
- 501 thousand–1.0 million
- 1.1–3 million
- 3.1–6 million
- 6.1–9 million
- 9.1–2 million
- 12.1–15 million
- 15.1–18 million
- 18.1–21 million
- 21.1–24 million
- 24.1–27 million
- 27.1–30 million
- 30.1–33 million
- 33.1–36 million
- 36.1–39 million
- 39.1–42 million
- 42.1–45 million
- 45.1–48 million
- 48.1–51 million
- over 51 million (please specify) _____

12a. Please estimate the percentage change in gross sales revenue for 2012 over 2011 and indicate whether this was an increase (+) or a decrease (-). Calculate using the formula 2012 sales divided by 2011 sales and multiplied by 100.

_____ %

12b. Looking forward to 2013, please estimate the expected percentage change in gross sales revenue for 2013 over 2012 and indicate whether this will be an increase (+) or a decrease (-). Calculate using the formula expected 2013 sales divided by 2012 sales and multiplied by 100.

_____ %

13. What proportion of 2012 operating costs do each of the following represent (approximate).

- Wood costs _____ %
 - Labour and benefits _____ %
 - Interest _____ %
 - Depreciation _____ %
 - Other operating costs (specify top 2)
 - _____ %
 - _____ %
 - Others _____ %
- Total 100 %

Electronic Commerce:

14a. Does your company maintain a website?

- Yes
- No

14b. Does your company sell products or services through the web?

- Yes
- No

14c. Does your company purchase or search the web for inputs?

- Yes
- No

14d. Does your company search the Web for manufacturing advice?

- Yes
- No

14e. If you use social media, select the ones your company uses?

- Facebook
- Twitter
- Linked-in
- YouTube
- None
- Other _____

14f. What are your key issues for not adopting or expanding your company's use of e-commerce?

Appendix 3: Listing of products within each business type

Remanufactured Products

- Lumber specialties
- Sawmill specialties
- Custom processing
- Fencing
- Cutstock
- Siding
- Decking

Engineered Wood Products

- Laminated beams
- Log homes
- Trusses
- Treated wood
- Prefab buildings
- Laminated veneer lumber

Millwork

- Doors
- Architectural woodwork
- Windows
- Turned wood
- Moulding
- Stairs
- Flooring

Cabinets

- Kitchen cabinets
- Cabinet doors
- Vanity cabinets
- Countertops

Furniture

- Household
- Commercial and institutional
- Ready to assemble
- Patio

Pallets and Containers

- Pallets
- Boxes, bins, and crates
- Shipping materials

Shakes and Shingles

Panelboards

- Plywood
- Oriented strandboard
- Particleboard
- Medium density fibreboard

Other Wood Products

- Poles and posts
- Wood novelties
- Veneer
- Woodcrafts
- Instruments
- Fuelwood pellets

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